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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,885	09/05/2003	Seong-Won Cho	GAIN2.002C1	1556

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EXAMINER
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SCHAFER, JONATHAN C

ART UNIT	PAPER NUMBER
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2624

DATE MAILED: 04/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/656,885

Applicant(s)

CHO, SEONG-WON

Examiner

Jonathan C. Schaffer

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____.  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>04/28/2004</u> .  | 6) <input type="checkbox"/> Other: ____.                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-? are rejected under 35 U.S.C. 103(a) as being unpatentable over Daugman (U.S. Patent Number 5,291,560), and further in view of Daubechies et al. (*Image Coding Using Wavelet Transform*, IEEE Transactions on image processing, Vol. 1, No. 2, April 1992).

***1. A method of processing an iris image data, comprising:***

***providing data representing an image of an iris of an eye;***

Daugman discloses an iris image processing method, which provides data representing an image of an iris Fig. 1.

***performing a Daubechies wavelet transform on the iris image data, thereby dividing the iris image data into multiple data segments;***

Daugman discloses dividing the image of the iris into multiple data segments (Fig. 2) as well as performing wavelet transforms (Fig. 4A-C). Daugman however does not disclose the use of a

Daubechies wavelet transform, most likely due to the fact the Daugman's invention was filed for in 1991 and Daubechies didn't publish her transform technique until 1992. Daubechies does however disclose a Daubechies wavelet transform used in image coding which would include an image of an iris. It would have been obvious to one of ordinary skill in the art to which the applicant's invention pertains to use a Daubechies wavelet transform in place of Daugman's original wavelet transform for the reasons suggested in Daubechies publication itself, to save CPU time.

***repeating the Daubechies wavelet transform a predetermined number of times on one of the data segments divided in the immediately previous transform, thereby dividing the data segment on which the transform is performed into smaller data segments, wherein the data segment on which the transform is performed represents more information on iris patterns than the other data segments divided in the immediately previous transform; and***

Disclosed in Daubechies Fig. 7

***forming a characteristic vector of the iris image comprising information of at least one data segment divided in each Daubechies wavelet transform.***

Daubechies discloses after the initial step of wavelet transform the next step the wavelet coefficients are vector quantized which reads on forming a characteristic vector (pg. 205, col. 1, l. 13).

***2. The method of claim 1, wherein the data segment representing more information on iris pattern than the other segments divided in the immediately previous transform comprise more low frequency components than the other segments.***

Daubechies Fig. 7.

***3. The method of claim 1, wherein each of the data segments produced in each Daubechies wavelet transform is classified based on frequency components of the data.***

Daubechies Fig. 7.

***4. The method of claim 1, wherein each of the data segments produced in each Daubechies wavelet transform is classified based on frequency components of the data in two perpendicular directions on an image each data represents.***

Daubechies Fig. 7.

***5. The method of claim 1, wherein each of the data segments produced in each Daubechies wavelet transform is classified one of HH, HL, LH and LL, wherein HH represents high frequency components in a first direction and a second direction on an image each data represents, the first and second directions being perpendicular to each other, wherein HL represents a high frequency component in the first direction and a low frequency component in the second direction, wherein LH represents a low frequency component in the first direction and a high frequency component in the second direction, and wherein LL represents low frequency components in the first and second directions.***

Daubechies Fig. 7.

***6. The method of claim 5, wherein the characteristic vector comprises information of a data segment characterized as HH divided in each of the Daubechies wavelet transform.***

Daubechies Fig. 7.

**7. The method of claim 6, wherein the information of the HH data segment comprises an average value of data of the segment representing the image thereof.**

Daubechies Fig. 7.

**8. The method of claim 5, wherein the characteristic vector comprises information of a data segment characterized as LL divided in the last Daubechies wavelet transform.**

Daubechies Fig. 7.

**9. The method of claim 8, wherein the information of the LL data segment comprises a substantial portion of the data of the segment representing the image thereof.**

Daubechies Fig. 7.

**10. The method of claim 8, wherein the information of the LL data segment comprises all of the data of the segment representing the image thereof.**

Daubechies Fig. 7.

**11. The method of claim 5, wherein a total number of the Daubechies wavelet transform is  $N$ , the characteristic vector comprises an  $N-1$  number of values of HH data segments.**

Daubechies Fig. 5.

**12. The method of claim 1, further comprising quantizing values of the characteristic vector.**

Daubechies Fig. 7.

**13. The method of claim 1, wherein the predetermined number of repetitions is set such that a total number of the Daubechies wavelet transform is from 2 to 7.**

Daubechies Fig. 7.

**14. The method of claim 1, wherein the predetermined number of repetitions is set such that a total number of the Daubechies wavelet transform is from 4.**

Daubechies Fig. 7.

**15. The method of claim 1, further comprising registering the characteristic vector with or without further processing.**

Daubechies Fig. 7, Daubechies discloses after the initial step of wavelet transform the next step the wavelet coefficients are vector quantized which reads on forming a characteristic vector (pg. 205, col. 1, l. 13).

**16. A device for use in processing iris image data, comprising:**

**means for providing data representing an image of an iris of an eye;**

See the rejection for claim 1, first limitation.

*means for performing a Daubechies wavelet transform on the iris image data, thereby dividing the iris image data into multiple data segments, wherein the means for performing the transform is configured to repeat the Daubechies wavelet transform a predetermined number of times on one of the data segments divided in the immediately previous transform, thereby dividing the data segment on which the transform is performed into smaller data segments, and wherein the data segment on which the transform is performed represents more information on iris patterns than the other data segments divided in the immediately previous transform; and*

See the rejection for claim 1, second and third limitations.

*means for forming a characteristic vector of the iris image comprising information of at least one data segment divided in each Daubechies wavelet transform.*

See the rejection for claim 1, fourth limitation.

**17. The method of claim 1, further comprising processing the characteristic vector to determine whether the iris image matches a pre-registered iris image.**

Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

**18. The method of claim 17, wherein the characteristic vector is processed together with a characteristic vector of the pre-registered iris image to produce an inner product of the characteristic vectors.**



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Daubechies Fig. 7, Daubechies discloses after the initial step of wavelet transform the next step the wavelet coefficients are vector quantized which reads on forming a characteristic vector (pg. 205, col. 1, l. 13). Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

***19. The method of claim 17, wherein the iris image is determined to match the pre-registered iris image when an inner product of the characteristic vector and a characteristic vector of the pre-registered iris image is greater than a predetermined threshold value.***

Daubechies Fig. 7, Daubechies discloses after the initial step of wavelet transform the next step the wavelet coefficients are vector quantized which reads on forming a characteristic vector (pg. 205, col. 1, l. 13). Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

***20. A device for processing iris image data, comprising:***

***an input device configured to receive data representing an image of an iris of an eye;***

See the rejection for claim 1, first limitation.

***a first circuit configured to perform a Daubechies wavelet transform on the iris image data a predetermined number of times; and***

See the rejection for claim 1, second limitation.

***a second circuit configured to form a characteristic vector of the iris image based on the Daubechies wavelet transform.***

See the rejection for claim 1, fourth limitation.

***21. A device for identifying an iris pattern, comprising:***

***means for obtaining a characteristic vector from an iris image in accordance with the method of processing an iris image data of claim 1; and***

See the rejection of claim 1.

***means for processing the characteristic vector to determine whether the iris image matches a pre-registered iris image.***

Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

***22. A security system comprising:***

***the iris image data processing device of claim 20; and***

See the rejection of claim 20.

***a third circuit configured to process the characteristic vector to determine whether the iris image matches a pre-registered iris image.***

Daugman discloses a match determination of one iris image to another (Fig. 1, 26, 28).

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan C. Schaffer whose telephone number is (571)272-0603. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JS

JINGGEWU  
PRIMARY EXAMINER

